WHAT IS CLAIMED IS:

1. A phase shifting photomask comprising:

   a plurality of transmitting nonprinting windows transmitting light in a first phase;

   a transmitting area transmitting light in a second phase, each transmitting window substantially entirely surrounded by and in contact with the transmitting area with no blocking material intervening,

   wherein the second phase is substantially opposite the first phase, and

   wherein a first width of unbroken transmitting area surrounds each transmitting window on all sides, the first width sufficient for the unbroken transmitting area to print when the photomask is used to expose photoresist.

2. The photomask of claim 1 wherein the first phase is about 180 degrees and the second phase is about 0 degrees.

3. The photomask of claim 2 wherein the shortest dimension of any of the plurality of nonprinting transmitting windows parallel to the plane of the photomask is no more than about 160 nm x S.

4. The photomask of claim 3 wherein the shortest dimension of any of the plurality of nonprinting transmitting windows parallel to the plane of the photomask is no more than about 120 nm x S.

5. The photomask of claim 3 wherein at least one of the plurality of transmitting windows is rectangular.

6. The photomask of claim 5 wherein all of the transmitting windows are rectangular.

7. The photomask of claim 3 wherein the transmitting windows are uniformly spaced.

8. The photomask of claim 2 wherein the first width of unbroken transmitting area is at

least 100 nm x S.

9. The photomask of claim 3 wherein the first phase is about 0 degrees and the second phase is about 180 degrees.

10. The photomask of claim 9 wherein the shortest dimension of any of the plurality of nonprinting transmitting windows in the plane of the photomask is no more than about 160 nm x S.

11. The photomask of claim 10 wherein the shortest dimension of any of the plurality of nonprinting transmitting windows in the plane of the photomask is no more than about 120 nm x S.

12. The photomask of claim 9 wherein at least one of the plurality of transmitting windows is rectangular.

13. The photomask of claim 12 wherein all of the transmitting windows are rectangular.

14. The photomask of claim 9 wherein the transmitting windows are uniformly spaced.

15. The photomask of claim 9 wherein the first width of unbroken transmitting area is at least 100 nm x S.

16. A phase shifting photomask comprising:

a transmitting nonprinting window transmitting light in a first phase; and

a transmitting area substantially entirely surrounding and in contact with the transmitting window on all sides with no blocking material intervening,

wherein the transmitting area transmits light in a second phase, the second phase substantially opposite the first phase, and

wherein, when used to pattern photoresist, the transmitting area is printing on all sides of the transmitting window.

17. The photomask of claim 16 wherein the first phase is about zero degrees and the second phase is about 180 degrees.

18. The photomask of claim 17 wherein a shortest dimension of the first nonprinting transmitting window parallel to the plane of the photomask is no more than about 160 nm x S.

19. The photomask of claim 17 wherein a shortest dimension of the nonprinting transmitting window parallel to the plane of the photomask is no more than about 120 nm x S.

20. The photomask of claim 17 wherein a width of the transmitting area on all sides of the transmitting window is at least 100 nm x S.

21. The photomask of claim 16 wherein the first phase is about 180 degrees and the second phase is about zero degrees.

22. The photomask of claim 21 wherein the shortest dimension of the nonprinting transmitting window parallel to the plane of the photomask is no more than about 160 nm x S.

23. The photomask of claim 21 wherein the shortest dimension of the nonprinting transmitting window parallel to the plane of the photomask is no more than about 120 nm x S.

24. The photomask of claim 21 wherein a width of the transmitting area on all sides of the transmitting window is at least 100 nm x S.

25. A phase shifting photomask comprising:

a plurality of spatially separate transmitting nonprinting windows transmitting

light in a first phase; and

a transmitting area transmitting light in a second phase, the second phase substantially opposite the first, the transmitting area entirely surrounding and in contact with each of the transmitting windows of the first plurality;

wherein each transmitting window is separated from its nearest neighbor in the plurality by an unbroken length of transmitting area having at least a first dimension, and

wherein the smallest dimension of each window is no more than about 160 percent of the first dimension.

26. The photomask of claim 25 wherein the first phase is about zero degrees and the second phase is about 180 degrees.

27. The photomask of claim 26 wherein the first dimension is at least about 100 nm x S.

28. The photomask of claim 27 wherein the smallest dimension of each window is less than about 160 nm x S.

29. The photomask of claim 26 wherein the plurality of tranmitting nonprinting windows are arranged in a grid pattern.

30. The photomask of claim 25 wherein the first phase is about 180 degrees and the second phase is about zero degrees.

31. The photomask of claim 30 wherein the first dimension is at least about 100 nm x S.

32. The photomask of claim 31 wherein the smallest dimension of each window is less than about 160 nm x S.

33. The photomask of claim 30 wherein the plurality of tranmitting nonprinting windows are arranged in a grid pattern.

34. A phase shifting photomask comprising:

a transmitting nonprinting window having a first shifting degree;

a second transmitting area having a second shifting degree, the second transmitting area entirely surrounding and in contact with the first transmitting window, wherein the second transmitting area is printing on all sides of the transmitting window; and

wherein the second shifting degree is substantially opposite the first shifting degree.

35. The photomask of claim 34 wherein the first shifting degree is about zero degrees and the second shifting degree is about 180 degrees.

36. The photomask of claim 35 wherein the shortest dimension of the second transmitting area in the plane of the photomask is no more than about 160 nm x S.

37. The photomask of claim 36 wherein the shortest dimension of the second transmitting area in the plane of the photomask is no more than about 120 nm x S.

38. The photomask of claim 22 wherein the second transmitting area has a rectangular shape.

39. The photomask of claim 34 wherein the first shifting degree is about 180 degrees and the second shifting degree is about zero degrees.

40. The photomask of claim 39 wherein the shortest dimension of the second transmitting area in the plane of the photomask is no more than about 160 nm x S.

41. The photomask of claim 40 wherein the shortest dimension of the second transmitting area in the plane of the photomask is no more than about 120 nm x S.

42. The photomask of claim 39 wherein the second transmitting area has a rectangular shape.

43. A method for forming a patterned feature on a wafer surface, the method comprising:

transmitting light through a phase shifting photomask onto photoresist covering the wafer surface;

forming an isolated first residual photoresist feature between a first wafer area exposed to light in a first phase and a second wafer area exposed to light in a second phase, wherein the first phase is substantially opposite the second phase, and

wherein the second wafer area entirely surrounds the first wafer area in the plane of the wafer; and

forming the patterned feature from the photoresist feature.

44. The method of claim 43 wherein the first phase is about zero degrees and the second phase is about 180 degrees.

45. The method of claim 44 wherein:

the step of forming an isolated photoresist feature comprises developing photoresist, and

the step of forming the patterned feature comprises etching, and

the first residual photoresist feature defines a closed shape having a perimeter, and,

after the developing step and before the etching step, no portion of the wafer surface is exposed within the perimeter.

46. The method of claim 45 wherein the shortest dimension of the photoresist feature measured in the plane of the wafer surface is no greater than about 150 nm.

47. The method of claim 44 further comprising forming a plurality of residual photoresist features,

wherein each photoresist feature of the plurality is exposed to light in the first phase, and

each photoresist feature of the plurality is entirely surrounded by the second wafer area.

48. The method of claim 47 wherein each of the plurality of photoresist features defines a closed shape having a perimeter, and, after the developing step and before the etching step, no portion of the wafer surface is exposed within the perimeter.

49. The method of claim 48 wherein the plurality of photoresist features is uniformly spaced.

50. The method of claim 48 wherein the plurality of photoresist features is randomly spaced.

51. The method of claim 48 wherein a patterned feature is formed on the wafer surface from each of the plurality of photoresist features, and wherein the patterned features are portions of memory cells forming a first memory level in a memory array, the first memory level formed at a first height above a substrate.

52. The method of claim 51 wherein the memory array is a monolithic three dimensional memory array, the array further comprising at least a second memory level formed at a second height above the substrate, the second height different from the first height.

53. The method of claim 43 wherein the first phase is about 180 degrees and the second phase is about zero degrees.

54. The method of claim 53 wherein:

the step of forming an isolated photoresist feature comprises developing photoresist, and

the step of forming the patterned feature comprises etching, and

the first residual photoresist feature defines a closed shape having a perimeter, and,

after the developing step and before the etching step, no portion of the wafer surface is exposed within the perimeter.

55. The method of claim 54 wherein the shortest dimension of the photoresist feature measured in the plane of the wafer surface is no greater than about 150 nm.

56. The method of claim 55 further comprising forming a plurality of residual photoresist features,

wherein each photoresist feature of the plurality is exposed to light in the first phase, and

each photoresist feature of the plurality is entirely surrounded by the second wafer area.

57. The method of claim 56 wherein each of the plurality of photoresist features defines a closed shape having a perimeter, and, after the developing step and before the etching step, no portion of the wafer surface is exposed within the perimeter.

58. The method of claim 57 wherein the plurality of photoresist features is uniformly spaced.

59. The method of claim 57 wherein the plurality of photoresist features is randomly spaced.

60. The method of claim 57 wherein a patterned feature is formed on the wafer surface from each of the plurality of photoresist features, and wherein the patterned features are portions of memory cells forming a first memory level in a memory array, the first memory level formed at a first height above a substrate.

61. The method of claim 60 wherein the memory array is a monolithic three dimensional

memory array, the array further comprising at least a second memory level formed at a second height above the substrate, the second height different from the first height.

62. A method for forming photoresist features on a wafer surface using a photomask, the method comprising:

transmitting light through a first mask area onto a first wafer area, the first mask area having a first shifting degree;

transmitting light through a second mask area onto a second wafer area, the second mask area having a second shifting degree,

wherein the second mask area entirely surrounds and is on all sides in contact with the first mask area, and the first shifting degree is substantially opposite the second shifting degree; and

developing photoresist, wherein, after the developing step, a closed residual photoresist feature remains between the first wafer area and the second wafer area, and wherein the closed residual photoresist feature is isolated and not merged with any adjacent photoresist feature.

63. The method of claim 62 wherein the first shifting degree is about zero degrees and the second shifting degree is about 180 degrees.

64. The method of claim 63 wherein, after the developing step, no wafer surface is exposed within the first wafer area.

65. The method of claim 62 wherein the first shifting degree is about 180 degrees and the second shifting degree is about zero degrees.

66. The method of claim 65 wherein, after the developing step, no wafer surface is exposed within the first wafer area.

67. A monolithic three dimensional memory array comprising:

a plurality of patterned features, the plurality of patterned features patterned using

a photomask comprising:

a plurality of spatially separate first transmitting windows, wherein the transmitting windows transmit light in a first phase; and

a transmitting area of the photomask, each transmitting window substantially surrounded by and in contact with the transmitting area,

wherein the transmitting area transmits light in a second phase, the second phase substantially opposite the first phase.

68. The monolithic three dimensional memory array of claim 67, wherein the patterned features comprise substantially coplanar pillars.

69. The monolithic three dimensional memory array of claim 68 wherein the pillars have a diameter no more than about 150 nm.